# ABSTRACT

We propose to perform a **precision measurement** of inclusive electron scattering cross sections in the quasielastic region at different scattering angles and for several nuclei ($^2H$,$^3$He, $^4$He, $^{12}$C, $^{27}$Al, $^{56}$Fe and $^{208}$Pb). We will extract the longitudinal and the transverse response functions at momentum transfers in the range $0.5 \leq Q^2 \leq 1.5(GeV/c)^2$ with a precision of few percents ( between 1% and 12% for the longitudinal response in the whole range of momentum transfers).

A survey of the existing data from different laboratories shows a poor precision and a limited range of momentum transfer available in these measurements leaving open speculations on the origin of the quenching of the Coulomb sum rule. Several explanations with totaly different physics consequences were proposed to explain the quenching of the Coulomb sumrule and it is to have a better quality data for a more stringent comparison with the different physics ideas that we are proposing this measurement. It is also to look into the scaling behavior of the separated response functions in order to have a better understanding of the momentum distribution of nucleons in nuclei. We would like to emphasize the importance of inclusive measurements. The main advantage of performing inclusive measurements is the possibility to have a description of the system using the closure relation especially for heavy and medium weight nuclei. In other words the sensibility to final state iteractions and contributions of many body currents will lead to a redistribution of the strength observed in the quasi-elastic region over a wider range of energy loss. The inclusive measurements are doubtlessly complementary to the exclusive program at CEBAF allowing a chek of consistency on the exclusive measurements planned to study the problem we are addressing in this proposal.

**The angular range (10° to 160°) covered by the electron spectrometer in hall A combined with the energy range of the incident beam (.5 GeV to 4 GeV) and the duty cycle of a 100% make truly CEBAF a unique facility for this high precision measurement.**